Central Imagery Office

DRAFT

National Imagery Transmission Format Standard (NITFS)

Profile for Imagery Archives Extensions

Test Plan

Version .2

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Preface

This document was prepared by an integrated contractor team led by Booz-Allen & Hamilton Inc. for the Central Imagery Office. Comments or requests for additional information are welcome and should be addressed to:

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The editors gratefully acknowledge the work previously done by imagery community teams who have focused on the definition of standards, guidelines, and conventions.

Additional copies of this or related documents may be obtained by written request.

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Executive Summary

This certification test will determine to what extent a digital imagery system is able to generate/pack/display Imagery Archive data in the following six formats:

Profile for Imagery Archives Image	(PIAMB)
Profile for Imagery Archives Product	(PIAPRC)
Profile for Imagery Archives Target	(PIATGA)
Profile for Imagery Archives Person	(PIAPEA)
Profile for Imagery Archives Event	(PIAEVA)
Profile for Imagery Archives Equipment	(PIAEQA)

This test will also determine the ability of the systems under test to interpret/unpack/ display this data. This plan will provide an assessment of the usability of the system from a human factors perspective. This plan is a generic test plan for use with a variety of digital imagery systems for compliance with the above formats.

This test will use a build-up approach, the first portion will determine that the formats are read and created properly under a variety of conditions. The second phase will confirm that the system under test properly uses these formats in the image subheader. This test will not cover the third phase, full NITF compliance or transmission protocols, as they are covered in the National Imagery Transmission Format Standard (NITFS) Certification Test Plan, 3 January 1994.

The primary method of testing systems for both interpret and generate is through the use of control files and/or scenarios comprised of multiple test cases which are provided to the system operator. A combination of visual and electronic file comparisons are then used to determine if the test criteria are met for each subtest.

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1 INTRODUCTION

1.1 Background.

The National Imagery Transmission Format Standard (NITFS) is the standard for formation digital imagery and imagery-related products and exchanging them among member of the Intelligence Community (IC). The Central Imagery Office (CIO) oversees the process whereby digital imagery systems achieve and sustain NITFS compliance through the Certification Test and Evaluation (CTE) program. The Joint Interoperability Test Center (JITC) serves as Executive Agent to the CIO for the execution of NITFS test related activities and is the responsible organization for execution of the NITFS CTE Program. The NITFS CTE Program is fully describe in JIEO Circular 9008, NITFS Certification Test and Evaluation Program Plan.

1.2 Purpose.

The NITFS subtest for controlled extensions is designed to determine if the System Under Test (SUT) can properly unpack and use Controlled Tag Extended Header Data. This test supplements the NITFS test in that it will determine to what extent the digital imagery SUT is able to generate/pack/display and unpack/ interpret/ display the specific data contained in the Profile for Imagery Archives Extensions.

1.3 Scope.

1.3.1 Overview.

The certification test is designed as a standards conformance test and will be conducted at the JITC NITFS CTE Facility located at Fort Huachuca, Arizona, unless otherwise requested by the sponsor and approved by the Test Director. This generic test plan is intended for repeated use for testing compliance with the Imagery Archives Support Extensions.

1.3.1.1 NITFS Certification Test Plan.

The NITFS test consists of 21 subtests designed to determine to what extent the digital imagery System Under Test (SUT) is able to generate/pack/display imagery, symbols, labels, text, and associated data in the NITF file format; exchange NITF files using the Tactical communications Protocol 2 (TACO2); and unpack/interpret/display NITF imagery, symbols, labels, text, and associated data.

1.3.1.2 PIAE Test Plan.

The test consists of eight subtests, one for each of the Imagery Archive Formats, an evaluation of the controlled tag extension implementation and a useability assessment. The useability assessment will be made in conjunction with the testing as a service to the SUT Sponsor, not as a requirement for certification.

1.4 Applicable Documents.

1. MIL-STD-2500. National Imagery Transmission Format (Version 2.0), 18 June 1993.

2. JIEO 9008. NITFS Certification Test & Evaluation Program Plan, 30 June 1993.

3. MIL-HDBK-1300. Military Handbook NITFS, 18 June 1993.

4. AFOTEC PAMPHLET 800-2, Volume 4, Acquisition Management, Software Usability Evaluator's Guide, Department of the Air Force, HQ Air Force Operational Test and Evaluation Center (AFOTEC), 23 November 1987.

5. MIL-STD-1472D, Human Engineering Design Criteria for Military Systems, Equipment and Facilities, 14 March 1989.

6. DOD Handbook 761, Human Engineering Guidelines for Management Information Systems, 28 June 1985.

1.4.1 Resources.

The Imagery Archive conformance test will require approximately three days. The sponsor of the SUT is responsible for supplying the SUT hardware/software and a system operator or administrator for certification testing.

1.4.2 Limitations.

This test is designed with the intent of providing a high level of confidence that a SUT successfully passing this test will be in compliance with the NITFS profiles for imagery archives. It is not feasible to test all possible combinations of conditions that may occur during field operations. In recognition of this limitation, the test exercises minimum and maximum boundary conditions as well as a limited set of random intermediate conditions. Sponsors of NITFS certified systems are encouraged to provide the CTE Facility with feedback regarding any NITFS problems which arise in the field. The CTE Facility will analyze all identified problems and take positive action to increase the rigor of certification testing as needed.

2 DATA FORMATS

2.1 Profile for Imagery Archives Image (PIAIMB).

The purpose of the support extension is to provide an area to place fields not currently carried in NITF but are contained in the *Standard Profile for Imagery Archives* (SPIA). Most imagery related information is contained in the NITF main headers and support data extensions. These extensions will minimize redundant fields while providing space for all information. This extension shall be present once for each image in the product. There may be up to 20 of these extensions per NITF file. The presence of this extension would be documented in the image subheader.

2.1.1 Format Structure.

Table 1. Profile for Imagery Archives Image (PIAIMB) Subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIAIMB	R
CEL	Length of PIAIMB extension	5	00337	R
CEDATA	User-defined data (Below)	337	See Table 2 below	R

(R) = Required, (O) = Optional, and (C) = Conditional

Table 2. PIAIMB Data and Ranges

Field	Name	Size	Value Range	Type
CLOUDCVR	Cloud Cover	3	000-100, 999	O
SRP	Standard Radiometric Product	1	Y, N	O
SENSMODE	Sensor Mode	12	WHISKBROOM, PUSHBROOM, FRAMING, SPOT, SWATH, TBD	O
SENSNAME	Sensor Name	18	Valid Sensor Name	O
SOURCE	Source	255	Alphanumeric	O
COMGEN	Compression Generation	2	00-99	O

Field	Name	Size	Value Range	Type
SUBQUAL	Subjective Quality	1	P-Poor, G - Good, E - Excellent, F- Fair	O
PIAMSNNUM	PIA Mission Number	7	EARS 1.1 page 4-28	O
CAMSPECS	Camera Specs	32	Alphanumeric	O
PROJID	Project ID Code	2	EARS Appendix 9	O
GENERATION	Generation	1	0-9	O
ESD	Exploitation Support Data	1	Y, N	O
OTHERCOND	Other Conditions	2	EARS 1.1 page 4-28	O

Table 3. Description of PIAIMB Data Fields

Field	Value Definitions and Constraints
CLOUDCVR	Indicates the percentage of the image that is obscured by cloud.
SRP	Indicates whether or not standard radiometric product data is available.
SENSMODE	Identifies the sensor mode used in capturing the image.
SENSNAME	Identifies the name of the sensor used in capturing the image.
SOURCE	Indicates where the image came from (e.g., magazine, trade show, etc.).
COMGEN	Counts the number of lossy compression is done by the archive.
SUBQUAL	Indicates a subjective rating of the quality of the image.
PIAMSNNUM	Indicates the mission number assigned to the reconnaissance mission.
CAMSPECS	Specifies the brand name of the camera used, and the focal length of the lens.
PROJID	Identifies collection platform project identifier code
GENERATION	Specifies the number of image generations of the product. The number zero (0) is reserved for the original product.
ESD	Indicates whether or not Exploitation Support Data is available and contained within the product data.
OTHERCOND	Indicates other conditions which affect the imagery over the target.

2.2 Profile for Imagery Archives Products (PIAPRC).

The data found in the Product Support Extension addresses information regarding the products derived from source imagery. While there is product related data in the NITF main header and Support Data Extensions (SDE), many fields contained in the SPIA are absent. This extension is proposed to align the SPIA and NITF for product information, and to add descriptive detail associated with products. This extension shall be present once for each

product and there will be one product per NITF file. The presence of this extension would be documented in the file header.

2.2.1 Format Structure.

Table 4. Profile for Imagery Archives Product (PIAPRC) Subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIAPRC	R
CEL	Length of PIAPRC extension	5	*191-63749*	R
CEDATA	User-defined data (Below)	*201-63759*	See Table 5 below	R

(R) = Required, (O) = Optional, and (C) = Conditional

Table 5. PIAPRC Data and Ranges

Field	Name	Size	Value Range	Type
ACCESSID	Access ID	64	Alphanumeric	O
FMCONTROL	FM Control Number	32	Alphanumeric	O
SUBDET	Subjective Detail	1	P- Poor, F - Fair, G - Good, E - Excellent	O
PRODCODE	Product Code	2	EARS 1.1 Appendix 6	O
PRODUCERSE	Producer Subelement	6	Alphanumeric	O
PRODIDNO	Product ID Number	20	Alphanumeric	O
PRODSNME	Product Short Name	10	Alphanumeric	R
PRODUCERCD	Producer Code	2	Alphanumeric	R
PRODCRTIME	Product Create Time	14	DDHHMMSSZMONYY	O
MAPID	Map ID	40	Alphanumeric	0
SECTITLEREP	SECTITLE Repetitions	2	0-99	R
SECTITLE1	Section Title	40	Alphanumeric	C
PPNUM1	Page/Part Number	5	Alphanumeric	C
TPP1	Total Pages/Parts	3	001-999	C
Repeated TPP's	For multiple sections			
.....				
SECTITLEnn	Section Title	40	Alphanumeric	C
PPNUMnn	Page/Part Number	5	Alphanumeric	C

Field	Name	Size	Value Range	Type
TPPnn	Total Pages/Parts	3	001-999	C
REQORGREP	REQORG Repetitions	2	00-99	R
REQORG1	Requesting Organization	64	Alphanumeric	C
Repeated data	For multiple organizations			
.....				
REQORGnn	Requesting Organization	64	Alphanumeric	C
KEYWORDREP	KEYWORD Repetitions	2	00-99	R
KEYWORD1	Keyword String 1	255	Alphanumeric	C
Repeated Data	For Multiple keywords			
.....				
KEYWORDnn	Keyword String nn	255	Alphanumeric	C
ASSRPTREP	ASSRPT Repetitions	2	00-99	R
ASSRPT1	Associated Report 1	20	Alphanumeric	C
Repeated data	For multiple reports			
.....				
ASSRPTnn	Associated Report nn	20	Alphanumeric	C
ATEXTREP	ATEXT Repetitions	2	00-99	R
ATEXT1	Associated Text 1	255	Alphanumeric	C
.....				
ATEXTnn	Associated Text nn	255	Alphanumeric	C

Table 6. Description of PIAPRC Data Fields

Field	Value Definitions and Constraints
ACCESSID	Contains an archive unique identifier. This could be the product filename, a record identifier, a reference number, the product id, or any other means to access the product from the archive.
FM CONTROL	Identifies foreign material associated with the product.
SUBDET	Indicates a subjective rating of useful detail available in the product.
PRODCODE	Identifies the category of product data stored in the archive.
PRODUCERSE	Identifies the element within the producing organization that created the product.
PRODIDNO	Identifies a product stored in the archive with a producer assigned number.
PRODSNME	Identifies the abbreviated name of a product stored in the archive.

Field	Value Definitions and Constraints
PRODUCERCD	Identifies the organization responsible for creating or modifying the product.
PRODCRTIME	Identifies the date or the date and time that the product was created or last modified.
MAPID	Identifies a map associated with the product.
SECTITLEREP	Identifies the number of times the SECTITLE, PPNUM, and TPP fields repeat per extension instance.
SECTITLE1	Identifies the first user defined title of a section of a multi-section product.
PPNUM1	Identifies the first page/part number of the section identified in SECTITLE1.
TPP1	Identifies the total number of pages or parts associated with SECTITLE1 and PPNUM1.
SECTITLEnn	Identifies the nnth user defined title of a section of a multi-section product.
PPNUMnn	Identifies the nnth page/part number of the section identified in SECTITLEnn.
TPPnn	Identifies the tnnth number of pages or parts associated with SECTITLE nn and PPNUM nn.
REQORGREP	Identifies the number of times the REQORG field repeats per extension instance.
REQORG1	Identifies the first organization requesting that an image be placed in an archive. This is the first field represented based on the value of REQORGREP.
REQORGnn	Identifies the nnth organization requesting that an image be placed in an archive. The number of REQORGs between the previous field and this is represented in the REQORGREP field.
KEYWORDREP	Identifies the number of times the KEYWORD field repeats per extension instance.
KEYWORD1	Provides the first block of a freeform text description of the product.
KEYWORDnn	Provides the nnth block of a freeform text description of the product. The number of KEYWORDSs between the previous field and this is represented in the KEYWORDREP field.
ASSRPTREP	Identifies the number of times the ASSRPTREP field repeats per extension instance.
ASSRPT1	First field for the entry of another known report associated with the product.
ASSRPTnn	Provides the nnth field of other known reports associated with the product. The number of ASSRPTs between the previous field and this is represented in the ASSRPTREP field.
ATEXTREP	Identifies the number of times the ATEXTREP field repeats per extension instance.

Field	Value Definitions and Constraints
ATEXT1	Provides the first text block further describing the imagery product.
ATEXTnn	Provides the nnth text block further describing the imagery product. The number of ATEXTs between the previous field and this is represented in the ATEXTREP field.

2.3 Profile for Imagery Archives Target Support (PIATGA).

The Target Extension is designed to accommodate more than just the essential target data. It contains descriptive data about the targets. This extension shall be present once for each target identified in the image. There may be up to 250 of these extensions per NITF file. The presence of this extension would be documented in the image subheader.

2.3.1 Format Structure.

Table 7. Profile for Imagery Archive Target (PIATGA) Subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIATGA	R
CEL	Length of PIATGA extension	5	00096	R
CEDATA	User-defined data (Below)	96	See Table 8 below	R

(R) = Required, (O) = Optional, and (C) = Conditional

Table 8. PIATGA Data and Ranges

Field	Name	Size	Value Range	Type
TGTUTM	Target UTM	15	XXXNNnnnnnnnnn	O
PIATGAID	Target Identification	15	6 character Target ID 10 Character BE, or 15 character BE + suffix	O
PIACTRY	Country Code	2	Per FIPS 10-3	O
PIACAT	Category Code	5	DIAM 65-3-1	O
TGTGEO	Target Geographic Coordinates	15	ddmmssXdddmmssY	O

DATUM	Target Coordinate Datum	3	In accordance with XI-DBDD-08 93 Aug 93, Appendix B, Attachment 10.	O
TGTNAME	Target Name	38	alphanumeric target names	O
PERCOVER	Percentage of Coverage	3	000-100	O

Table 9. Description of PIATGA Data Fields

Field	Value Definitions and Constraints
TGTUTM	Identifies the Universal Transverse Mercator (UTM) grid coordinates that equate to the geographic coordinates of the target element.
PIATGAID	Identifies a point or area target (DSA, LOC or BAS)
PIACTRY	Identifies the country in which the geographic coordinates of the target element reside.
PIACAT	Classifies a target element by its product or the type of activity in which it can engage.
TGTGEO	Specifies a point target's geographic location in latitude and longitude.
DATUM	Identifies the datum of the map used to derive the target coordinates (UTM or GEO).
TGTNAME	Identifies the official name of the target element based on the MIIDS/IDB name.
PERCOVER	Percentage of the target covered by the image.

2.4 Profile for Imagery Archives Person Identification (PIAPEA).

The Person Extension is designed to identify information contained in the Imagery Archive that is directly related to a person or persons contained in an image. This extension shall be present for each person identified in an image. There may be up to 500 occurrences of this extension per each NITF file. The presence of this extension would be documented in the image subheader.

2.4.1 Format Structure.

Table 10. Profile for Imagery Archives Person (PIAPEA) Subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIAPEA	R
CEL	Length of PIAPEA extension	5	00092	R
CEDATA	User-defined data (Below)	92	See Table 11 below	R

(R) = Required, (O) = Optional, and (C) = Conditional

Table 11. PIAPEA Data and Ranges

Field	Name	Size	Value Range	Type
LASTNME	Last Name	28	Alphanumeric	O
FIRSTNME	First Name	28	Alphanumeric	O
MIDNME	Middle Name	28	Alphanumeric	O
DOB	Birth Date	6	MMDDYY	O
ASSOCTRY	Associated Country	2	Per FIPS 10-3	O

Table 12. Description of PIAPEA Data Fields

Field	Value Definitions and Constraints
LASTNME	Identifies the surname of individual captured in an image.
FIRSTNME	Identifies the first name of individual captured in an image.
MIDNME	Identifies the middle name of individual captured in an image.
DOB	Identifies the birth date of the individual captured in the image.
ASSOCTRY	Identifies the country the person or persons captured in the image is/are associated with.

2.5 Profile for Imagery Archives Event (PIAEVA).

The Event Extension is designed to provided an area for specific information about an event or events that are identified on an image. This extension shall be present for each event identified in an image. There may be up to 100 of these extensions present per NITF file. The presence of this extension would be documented in the image subheader.

2.5.1 Format Structure.

Table 13. Profile for Imagery Archives Event (PIAEVA) Subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIAEVA	R
CEL	Length of PIAEVA extension	5	00046	R
CEDATA	User-defined data	46	See Table 14 below	R

(R) = Required, (O) = Optional, and (C) = Conditional

Table 14. PIAEVA Data and Ranges

Field	Name	Size	Value Range	Type
EVENTNAME	Event Name	38	Alphanumeric	O
EVENTTYPE	Event Type	8	POL, DIS, COMMO, MILEX, ECON, NUC, SPACE, MILMOV, CIVIL	O

Table 15. Description of PIAEVA Data Fields

Field	Value Definitions and Constraints
EVENTNAME	The recognized name of the event.
EVENTTYPE	Indicates the generic type of event associated with the product.

2.6 Profile for Imagery Archives Equipment Extension (PIAEQA).

The Equipment extension was created to provide space in the NITF file for data contained in the archive that is specifically related to equipment that is contained in an image. This extension shall be present for each instance of equipment identified in an image. There may be up to 250 occurrences of this extension per NITF file. The presence of this extension would be documented in the image subheader.

2.6.1 Format Structure.

Table 16. Profile for Imagery Archives Equipment Extension (PIAEQA) subheader

Field	Name	Size	Value Range	Type
CETAG	Unique extension type ID	6	PIAEQA	R
CEL	Length of PIAEQA	5	00130	R
CEDATA	User-defined data (Below)	130	See Table 17 below	R

Table 17. PIAEQA Data and Ranges

Field	Name	Size	Value Range	Type
EQPCODE	Equipment Code	7	NGIC Foreign Equipment Guide	O
EQPNOMEN	Equipment Nomenclature	45	NGIC Foreign Equipment Guide	O
EQPMAN	Equipment Manufacturer	64	Alphanumeric	O
OBTYPE	OB Type	1	MIIDS/IDB	O
ORDBAT	Type Order of Battle	3	EARS 1.1	O
CTRYPROD	Country Produced	2	FIPS 10-3	O
CTRYDSN	Country Code Designed	2	FIPS 10-3	O
OBJVIEW	Object View	6	Right, Left, Top, Bottom, Front, Rear	O

Table 18. Description of PIAEQA Data Fields

Field	Value Definitions and Constraints
EQPCODE	A unique designated equipment code identifying a category of equipment.
EQPNOMEN	Nomenclature used to identify a piece of equipment.
EQPMAN	Identifies the manufacturer of a piece of equipment.
OBTYPE	Indicates the type of order of battle according to MIIDS/IDB
ORDBAT	Indicates the type of order of battle according to EARS 1.1
CTRYPROD	Identifies the country that produced the object
CTRYDSN	Identifies the country that designed the original object
OBJVIEW	View of the object.

3 DETAILS OF TEST

3.1 General.

Each of the subtests in this section represents the separate operational and technical areas that a SUT must successfully perform to achieve Profile for Imagery Archives NITFS certification. Subtests 1 through 6 involve a number of common elements in the testing process. These elements and processes common among subtests are described in this general overview of the details of the test. Elements and test processes unique to a specific subtest are described in that subtest.

Each subtest will first determine that the formats have been properly created/interpreted. This will included range checking and out of bounds tests of the extensions only. This will be followed by testing to determine that these extensions are properly integrated into the image subheaders formats. The final testing , not covered here, will be the current NITFS testing.

3.2 Objectives

Each subtest has objectives listed within that specific subtest's section. A list of the subtests follows:

SUBTEST 1.	PIAIMB File Format
SUBTEST 2.	PIAPRC File Format
SUBTEST 3.	PIATGA File Format
SUBTEST 4.	PIAPEA File Format
SUBTEST 5.	PIAEVA File Format
SUBTEST 6.	PIAEQA File Format
SUBTEST 7.	Controlled Tag Extended Header Data
SUBTEST 8.	Useability

3.3 Criteria.

The following criteria are derived from the compliance requirements as stated in the NITFS CTE Program Plan, JIEO Circular 9008.

3.3.1 Information.

All information, including numbers, contained in the fields must be given in the printable ASCII character set [space (32) through tilde (126)] with eight bits (one byte) per character.

3.3.2 Length.

All length sizes or character counts given in header fields must specify the number of eight-bit bytes.

3.3.3 Alphanumeric.

All data in fields designated as "Alphanumeric" must be left justified and padded with spaces as necessary to fill the field.

3.3.4 Numeric.

All data in numeric fields must be right justified and padded with leading zeroes as necessary to fill the field.

3.3.5 Required fields.

All required fields must be present and must contain valid data.

3.3.6 Optional Fields.

All optional fields must be present, but may or may not contain valid data at the discretion of the operator. In the absence of valid data, optional numeric fields must be filled with zeroes; optional alphanumeric fields must be filled with spaces.

3.3.7 Conditional Fields.

Conditional fields are present only if indicated by the value of one or more preceding fields. If a conditional field is present, it must contain valid data.

3.4 Data Requirements.

3.4.1 Criterion Related.

3.4.1.1 Interpret/Unpack

a. Each NITF file used in this test
b. Hard and soft copies of the data displayed by the SUT.
c. Annotated data collection forms with any anomalies noted

3.4.1.2 Generate/Pack

a. Hard and soft copies of each control image with support data as provided to the SUT in the SUT's native mode for generation/packing into an NITF file.
b. Hard copies of NITF files generated by the SUT as interpreted and displayed by reference imagery system(s).
c. Soft copy evaluations of NITF files generated by the SUT.
d. Annotated data collection forms with any anomalies noted.

3.4.2 Configuration Management Data.

3.4.2.1 Inventory.

An inventory of hardware and software configuration items as listed in the CTE Forms submitted in the request for testing (see JIEO Circular 9008, Appendix C, 30 June 1993).

3.4.2.2 Final test configuration.

Final test configuration of the SUT's NITF executable to include:

- Size in bytes
- Data/time stamp information
- Compiler(s)/linker(s) name(s)/version(s)
- Available SUT documentation.
- Copy of SUT executable software.

3.4.3 Personnel Data as follows:

a. The CTE Test Team.
b. The SUT sponsor.
   - Organization
   - POC Name
   - Address
   - Phone Number
   - E-Mail Address
c. The developer team to include system operator during the test.
   - Name
   - Organization
   - Address/Phone number
d. Intended field operator (for useability evaluation).
   - Projected education level
   - Projected training requirements to operate system

3.4.4 Supplemental Data.

Descriptions of any other problems or anomalies encountered in the interpretation or generation of NITF files not covered above.

3.5 Test Procedures.

3.5.1 Test Conduct.

3.5.1.1 Interpret/unpack Test Process.

The interpret/unpack test process requires the SUT to interpret NITF control files provided to it.

3.5.1.1.1 NITF Control Files.

A set of NITF control files will be created by the test team. The files will be loaded via network file server, magnetic media, or otherwise made accessible to the SUT. Each file will be accessed by the SUT and the data displayed.

3.5.1.1.2 Displayed data.

The data displayed will be matched against the control file data and the assessment made and recorded on the test logs.

3.5.1.2 Generate/pack Test Process.

The generate test process requires the SUT to generate NITF files under the guidance of test scenarios. Electronic file comparisons will be made with control files maintained by the CTE Facility.

3.5.1.2.1 NITF Files.

NITF files will be created under the guidance of written test scenarios by the SUT. The contents in the file, along with additional information provided to the operator by the test scenario, will be used by the SUT to generate NITF files containing the features identified in the criteria.

3.5.1.2.2 Generated Files.

The generated files will be loaded via network file server, magnetic media, or otherwise made accessible to the reference imagery system(s). The NITF files generated by the SUT will be visually and electronically evaluated for compliance to the NITFS.

3.5.1.3 Regression Testing.

If changes are made to any of the NITFS configuration items and capabilities during any portion of the test, regression testing will be performed for the appropriate tests previously conducted. If testing falls behind schedule, the Test Director determines whether testing continues or is rescheduled.

3.5.2 Data Collection.

3.5.2.1 Criteria Related Data.

Criteria related data requirements apply to generate/pack functions of a SUT (subtests 1-6).

3.5.2.1.1 Interpret/Unpack.

a. Each NITF file used in this test
b. Hard and soft copies of the data displayed by the SUT.
c. Annotated data collection forms with any anomalies noted.

3.5.2.1.2 Generate/Pack.

Hard and soft copies of the file elements generated in an NITF file by the SUT will be collected. The file will be displayed by the NITF reference imagery system and analyzed visually and electronically for compliance. Observations will be recorded using the data collection forms. The test team will manually record problems or anomalies on data collection sheets tailored to each test file/scenario.

3.5.2.2 Test Conditions Data.

Test replication may be accomplished by using the previously selected files and recreating the hardware and software test configuration of the SUT. The SUT configuration will be

identified in the supplemental test information, verified during the test, and the verified configuration recorded in the final test report.

3.5.2.3 Configuration Management Data.

3.5.2.3.1 Configuration Prior to Test.

Prior to beginning the test, the hardware and software of the system will be inventoried to ensure all items correspond with the CTE forms received by the CTE Facility. Native mode capabilities will be reviewed in relation to NITFS functionality requirements. NITFS functional capabilities will be verified to determine which have or have not been implemented on the system.

3.5.2.3.2 Configuration Changes During Test.

Changes may be made to the hardware and/or software of the SUT during testing to correct any problems that arise. If required by the Test Director, regression testing will be conducted to ensure that hardware or software modifications did not affect the SUT's compliance to the NITFS.

3.5.2.3.3 Final Test Configuration.

At the conclusion of the test, the SUT's NITF executable(s) will be identified and recorded. Appendix B provides the configuration information that will be recorded during the test and provided in the final test report. A copy of the SUT documentation and configuration information will be retained at the CTE Facility. Any changes to the final tested SUT configuration must be reported to the CTE Facility as configuration modifications may affect SUT's compliance to the NITFS.

3.5.2.3.4 Supplemental Data.

Descriptions of problems or anomalies encountered in the interpretation or generation of NITF files will be manually recorded on the data collection sheets tailored to each test file/scenario and recorded in Test Incident Reports (TIRs).

3.6 Presentation of Results.

3.6.1 Criteria Related

For each subtest, a matrix summarizing the results of all test cases will be compiled from the manual data collection sheets and/or automated data collection methods. Subtest results will be presented in the final report in the form depicted by the abbreviated example in Appendix B.

A composite matrix will be provided in the NITFS Certification Test Report which presents the pass/fail status of all subtests and the overall certification test. An abbreviated example of this matrix is provided in Appendix B.

When anomalies which affect certification are detected, narrative will be used in the test report to detail the problem; problems related to file format will be identified in the results summary. File format test case failures will be explained in sufficient detail to ensure a full understanding of specific problems related to that subtest. Reference(s) will be included to specify the failed subtest criteria.

3.6.2 Other.

Anomalies and other findings will be presented in descriptive narrative.

3.7 Analysis and Discussion.

The test team will examine the collected test data to verify that the SUT correctly/properly interprets/unpacks and generates/packs NITF formatted files. Based on the total assessment, one of the following recommendations will be made:

a. Recommend unconditional certification.
b. Recommend certification with comment on problems which were not significant enough to prevent certification and are provided as information only.
c. Recommend provisional certification identifying problems which, though not significant enough to prevent certification, should be corrected with the next system update/release.
d. Recommend certification be withheld until significant problems identified by the test are corrected and the system is retested.

3.7.1 Criterion Related.

Overall compliance with all subtest criteria will be used to determine the SUT's performance in relation to the subtest objective. The analysis includes determining if all required fields are present and if so, verifying that they contain the correct data. All instances of non-compliance will be discussed to clarify the operational consequences.

3.7.2 Other.

Other findings will be discussed as necessary to clarify operational impacts or other NITF-related issues.

4 SUBTESTS 1-6 FILE FORMATS

4.1 Objective.

Determine to what extent the SUT can generate, pack, and provide files containing valid header and subheader data.

4.2 Criteria.

The following criteria are derived from the compliance requirements as stated in the NITFS CTE Program Plan, JIEO Circular 9008.

4.2.1 Information.

All information, including numbers, contained in the fields must be given in the printable ASCII character set [space (32) through tilde (126)] with eight bits (one byte) per character.

4.2.2 Length.

All length sizes or character counts given in header fields must specify the number of eight-bit bytes.

4.2.3 Alphanumeric.

All data in fields designated as "Alphanumeric" must be left justified and padded with spaces as necessary to fill the field.

4.2.4 Numeric.

All data in numeric fields must be right justified and padded with leading zeroes as necessary to fill the field.

4.2.5 Required Fields.

All required fields must be present and must contain valid data.

4.2.6 Optional Fields.

All optional fields must be present, but may or may not contain valid data at the discretion of the operator. In the absence of valid data, optional numeric fields must be filled with zeroes; optional alphanumeric fields must be filled with spaces.

4.2.7 Conditional Fields.

Conditional fields are present only if indicated by the value of one or more preceding fields. If a conditional field is present, it must contain valid data.

4.3 Data Requirements.

Data collection requirements are as follows.

4.3.1 Interpret/Unpack.

a. Each NITF file used in this test
b. Hard and soft copies of the data displayed by the SUT.

c. Annotated data collection forms with any anomalies noted

4.3.2 Generate/Pack.

a. Annotated data collection forms with any file format related anomalies noted.
b. Soft copies of production file/image(s).
c. Soft copies of NITF file(s) generated by the SUT as interpreted and displayed by reference imagery system(s).
d. Soft copy of automated evaluation reports of NITF files generated by the SUT.

4.4 Test Procedures.

4.4.1 Interpret/unpack Test Process.

The interpret/ unpack test process requires the SUT to interpret NITF control files provided to it.

4.4.1.1 NITF control files.

A set of NITF control files will be created by the test team. The files will be loaded via network file server, magnetic media, or otherwise made accessible to the SUT. Each file will be accessed by the SUT and the data displayed.

4.4.1.2 Data displayed.

The data displayed will be matched against the control file data and the assessment made and recorded on the test logs.

4.4.2 Generate/pack Test Process.

The generate test process requires the SUT to generate NITF files under the guidance of test scenarios. Electronic file comparisons will be made with control files maintained by the CTE Facility.

4.4.2.1 NITF files created.

NITF files will be created under the guidance of written test scenarios by the SUT. The contents in the file, along with additional information provided to the operator by the test scenario, will be used by the SUT to generate NITF files containing the features identified in the criteria.

4.4.2.2 Generated files.

The generated files will be loaded via network file server, magnetic media, or otherwise made accessible to the reference imagery system(s). The NITF files generated by the SUT will be visually and electronically evaluated for compliance to the NITFS.

4.4.3 Regression Testing.

If changes are made to any of the NITFS configuration items and capabilities during any portion of the test, regression testing will be performed for the appropriate tests previously conducted. If testing falls behind schedule, the Test Director determines whether testing continues or is rescheduled.

4.5 Presentation of Results.

The resulting test data will be mapped to the above criteria by means of a pass/fail matrix provided in the NITF Certification Test Report. Problems related to file format will be identified in the results summary. File format test case failures will be explained in sufficient detail to ensure a full understanding of specific problems related to this subtest.

4.6 Analysis and Discussion.

The test team will examine the test data collected to verify that the SUT correctly generates NITF formatted files. The analysis includes determining if all required fields are present and if so, contain the correct data. If anomalies are detected by comparing control images with the SUT generated images, then a determination will be made of the impact on NITFS certification.

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5 SUBTEST 7, CONTROLLED TAG EXTENDED HEADER DATA

5.1 Objective.

Determine if the SUT can properly unpack and use Controlled Tag Extended Header Data (EHD). If the system does not use Controlled Tag Extended Header Data, determine to what extent the presence of this data does not adversely affect the other legal components of the file. Determine that if the SUT uses Controlled Tag Extended Header Data on the pack side, to what extent it can pack and provide files containing valid Controlled Tag Extended Header Data.

5.2 Criteria.

5.2.1 Extended Header Data.

Upon receipt of a file which contains information in the Extended Header Data fields, the system must at least properly interpret the other legal components of the file.

5.2.2 Controlled Tags.

Only controlled tags approved by the ISMC may be used.

5.2.3 Required Fields.

Each registered controlled record extension consists of three required fields: CETAG (6 byte unique extension identifier), CEL (length of extension in bytes), and CEDATA (user-defined data).

5.2.4 Sequences of extensions.

A sequence of controlled tagged record extensions can appear in the EHD field of the NITF file header or in the Extended Subheader Data (ESD) field for any standard data type data item in the file. Controlled tags are currently limited to appear only in the image ESD field of the base image.

5.2.5 Date Extension Segment.

A sequence of controlled extensions can also appear in a Data Extension Segment which is designated to contain controlled extensions, but only if space is not available in the appropriate EHD field.

5.3 Data Requirements.

Data collection requirements are as follows.

5.3.1 Interpret/Unpack.

a. Annotated data collection forms with any Extended Header Data anomalies noted.
b. Hard copy of control base image with Extended Header Data.

5.3.2 Generate/Pack.

a. Annotated data collection forms with any Extended Header Data anomalies noted.

b. Hard and soft copies of control files with Extended Header Data exercised.
c. If anomalies exist, then hard and soft copies will be made of NITF files with Extended Header Data as displayed by reference imagery system(s).
d. Hard copies of the automated file comparison results.
e. Hard copies of control Extended Header Data test scenarios.

5.4 Test Procedures.

5.4.1 Interpret/Unpack.

The SUT will be required to interpret, unpack and display a series of predefined NITF files with imbedded test cases that exercise Extended Header Data criteria. The SUT's uncompressed images will be visually compared to the control images/files. Detailed Extended Header Data (Unpack) test cases are identified in APPENDIX E, Table E-17A.

5.4.2 Generate/Pack.

The SUT will be required to generate and pack a series of predefined NITF files (scenarios) with imbedded test cases that exercise Extended Header Data criteria. The files created by the SUT will be unpacked, interpreted, and displayed. The SUT's compressed images will be visually and electronically compared to the control images/files. Detailed Extended Header Data (Pack) test cases are identified in Appendix E, Table E-17B.

5.5 Presentation of Results.

After all of the test cases have been completed, data collection forms will be annotated with any anomalies that were detected on both the interpret and the generate side. Where anomalies occur, hard copies of the differences will be produced for analysis. A results matrix will be developed to provide subtest results.

5.6 Analysis and Discussion.

The test team will examine all test data collected to verify that the SUT correctly incorporates the use of Extended Header Data. If anomalies are detected by comparing control images with the SUT interpreted and generated images, then a determination will be made of the impact on NITFS certification.

6 SUBTEST 8, USEABILITY

6.1 Objective.

Determine the useability of the user-NITFS system interface.

6.2 Criteria.

6.2.1 System Documentation.

System documentation shall include:
a. A description of the potential users' education levels, necessary skills, and skill levels.
b. An HFE evaluation report.
c. An up-to-date operator's manual that adequately depicts operation, and is easy to use and understand.

6.2.2 The System.

a. The system shall have the appearance of a single integrated application with no perception of needing to exit and enter multiple routines to handle NITF operations.
b. The System shall display NITF File Components (images, Symbols, labels) automatically according to the NITF file header values without operator intervention.
c. The system shall allow the operator to view text components or image comment fields in conjunction with the image.
d. Roaming or panning capability shall be provided.

6.2.3 User-Friendliness.

The system shall have the following user-friendly attributes:
a. Descriptiveness. The user has available adequate explanations of every function the system performs and every function the user must perform.
b. Consistency. The behavior of the system and the documentation correspond to the expectations of the user.
c. Simplicity. The information presented to the user or entered by the user is grouped into short, readily understandable structures.
d. Confirmability. The system aids in validating data and avoiding or correcting errors.
e. Controllability. The user directs system operation.
f. Workload Suitability. The tasks required of the user are within the user's capability and the user performs a meaningful role.

6.2.4 User Alerts.

The system shall alert the user when:
a. Aspects of the system or the file being viewed, of which the user should be aware, are not readily apparent.
b. Text or image comment fields are included with the NITF file being viewed.

c. A rendering device (screen or other) cannot process an image, because it does not have the same pixel display capacity as the imagery processing board.
d. The rendered image is cropped, if the display device cannot process the full image size.
e. The system requires user action.

6.2.5 Changes and Additions.

It shall be possible to accomplish the following, depending on user access privileges, without re-coding and recompiling the program.
a. Setting and changing image display parameters.
b. Setting and changing default values.
c. Adding and editing labels, symbols, and text.

6.2.6 NITF file preparation.

The system shall:
a. Provide adequate information and guidance during the file preparation process for users with no knowledge of boundary requirements to prepare NITF files that do not exceed established boundary conditions for each compliance level.
b. Permit only the NITFS ASCII set of characters (without special word processing control codes, but with the proper CR/LF line terminators) to be entered in labels and text files.
c. Allow users to designate, select, manipulate, move, store, retrieve, and display graphic elements.

6.3 Data Requirements.

Data Collection requirements are as follows:

6.3.1 Criteria Related.

A detailed checklist including data collector comments on system documents, the user-NITF system interface, user alerts, changes, additions, and the NITF file preparation process.

6.3.2 Other.

The dates of test start and completion; identification of the data collector and operator(s); and, operator's education level, NITFS skills, and skill levels. Record of useability related problems and anomalies encountered.

6.4 Test Procedures.

6.4.1 Test Conduct.

During the test, a system useability evaluation will be conducted as a service to the SUT sponsor providing an unbiased view of operator useability and NITF related operational capabilities. The useability evaluation consists of applying HFE criteria to the SUT during the NITF file format portion of the test. Usability testing will be conducted in conjunction with NITF certification testing to the extent possible. Dedicated useability testing may be required to resolve problems identified during NITF certification testing. A trained operator will be observed performing the following tasks:

a. Packing compliant files within the constraints of the file types for which NITF certification is desired. This will include compressing imagery, packing imagery, symbols, labels, and text files into the specified NITF fields as well as transmitting files to another system.
b. Unpacking compliant files for which NITF certification is. This will include receiving files from another system; decompressing or expanding compressed imagery; and unpacking imagery, symbols, labels, and text files from NITF into the native mode format.

6.4.2 Data Collection Procedures.

A trained useability data collector will manually collect data on the NITF Usability Assessment Data Collection Form shown in Appendix E, Table E-20. Comments will be entered for exceptional positive useability characteristics and for problems and anomalies encountered.

6.5 Presentation of Results.

Results will be presented in tables (examples shown in Appendix D) summarizing data within criteria categories. Exceptional positive useability characteristics and problems or anomalies encountered will be presented narratively.

6.6 Analysis and Discussion.

Deficiencies and exceptional positive characteristics will be discussed narratively in relation to their impact on overall system useability.

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7 APPENDIX I, LIST OF ACRONYMS

ACRONYM	DEFINITION
ABPP	Actual Bits Per Pixel
AFOTEC	Air Force Operational Test and Evaluation Center
ARIDPCM	Adaptive Recursive Interpolated Differential Pulse Code Modulation
ASCII	American Standard Code for Information Interchange
ASD	Assistant Secretary of Defense
BPP	Bits-Per-Pixel
CEDATA	Controlled Extension Data
CEL	Controlled Extension Length
CETAG	Controlled Extension Tag
CGM	Computer Graphics Metafile
CIO	Central Imagery Office
CLEVEL(s)	Compliance Level(s)
COMRAT	Compression Rate Code
COMSEC	Communications Security
CR	Carriage Return
CR/LF	Carriage Return/Line Feed
CTE	Certification Test and Evaluation
DCF	Data Collection Form

ACRONYM	DEFINITION
DEIM	Data Export Identification Message
DES	Data Extension Segment
DISA	Defense Information Systems Agency
DOD	Department of Defense
DOS	Disk Operating System
EES	External Exploitation System
EHD	Extended Header Data
ESD	Extended Subheader Data
FEM	Facility Exploitation Manager
FTP	File Transfer Protocol
Gbyte	Gigabyte
GOSIP	Government Open Systems Interconnection Profile
GUI	Graphical User Interface
HQ	Headquarters
IC	Intelligence Community
IMAG	Imagery size
IMODE	Imagery Mode
IMODE B	Band Interleaved by Block
IP	Internet Protocol

ACRONYM	DEFINITION
ISMC	Imagery Standards Management Committee
JIEO	Joint Interoperability and Engineering Organization
JITC	Joint Interoperability Test Command
JPEG	Joint Photographic Experts Group
LAN	Local Area Network
LUT	Look-Up Table
MIL-HDBK	Military Handbook
MIL-STD	Military Standard
MOA	Memoranda of Agreement
NBPP	Number of Bits-per-pixel
NCCB	NITFS Configuration Control Board
NELUT	Number of LUT entries
NITF	National Imagery Transmission Format
NITFS	National Imagery Transmission Format Standard
NLIPS	Number of lines per symbol
NPIXPL	Number of pixels per line
NTB	NITFS Technical Board
NUMDES	Number of Data Extension Segments
NUMRES	Number of Reserved Extension Segments

ACRONYM	DEFINITION
NWDTH	Line Width
ODS	Output Data Server
PC	Personal Computer
POC	Point of Contact
POSIX	Portable Operating System Interface for Computer Environment
RAM	Random Access Memory
RRDS	Reduced Resolution Data Sets
SCOLOR	Symbol Color
SNUM	Symbol Number
SPID	Standards Profile for Imagery Distribution
SROT	Symbol Rotation
SUT	System Under Test
TACO2	Tactical Communications Protocol 2
TBP	To be Published
TCP/IP/FTP	Transfer Control Protocol/Internet Protocol/File Transfer Protocol
TIR	Test Incident Report
UDHD	User Defined Header Data
UDID	User Defined Image Data

ACRONYM	DEFINITION
USIS	United States Imagery System
VQ	Vector Quantization
WAM	Workload Allocation Message
WAN	Wide Area Network

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8 APPENDIX II, DATA COLLECTION

8.1 General.

Tables II-1 through II-4 located at the end of this appendix summarize the data collection requirements. Tables II-1A and II-1B capture the hardware and software configuration of the SUT. Table II-2 is an example of a data collection form and Table II-3 is the summary report of a subtest. Applicable data are collected under test scenarios for each test file that is generated. All collected data are labeled, catalogued, and directly traceable to the SUT, time of test/subtest, procedure, and test data set that was used. The supplemental test information contains any additions or deviations to these requirements for the particular SUT.

8.2 Forms.

One data collection form is used to record the results of each test file/scenario. Figure II-3 shows a sample data collection form. These forms are maintained in the data collection log for the SUT.

8.3 Magnetic Media

8.3.1 NITF File.

The external file naming convention should properly reflect Image Identification (Image_ID), Start/Stop FAF block numbers, and the Rset value in the IMAG field in the extension as .r0, .r1, .r2, etc.

8.3.2 Automated Test Tool Output Data.

The test tools, UNPK_2_0.EXE, SNIPER.EXE and COMP.EXE, generate automated data collection output comparisons for files generated by the SUT. These comparison routines identify the discrepancies between the header, image subheader and tag control files and the files generated by the SUT. After the test is completed, the resulting comparison files are transferred to a separate storage media and archived.

8.4 Hard Copy

8.4.1 Header/Subheader Files.

Hard copies of the header and subheader files for each of the NITF files generated by the SUT are collected. They are reviewed and stored in the data collection log of the SUT with the data collection form for that file.

8.4.2 Image Display.

A printout (when print services are available) of the image display is collected for each file unpacked by the CTE Facility digital imagery system or SUT. It is stored in the data collection log of the SUT with the data collection form for that file.

8.5 Test Results Matrices.

The NITF Certification Test Report will contain matrices summarizing the final test results of the SUT. A sample matrix is shown as Table II-4. The matrix will cross-reference the test files generated during the subtest with the individual requirements tested by the file. Based on the outcome of the individual requirements, the test results will indicate whether the SUT was able to successfully generate the NITF file.

Table II-1A. Test Configuration Data

SYSTEM CONFIGURATION DATA	ITEM VALUE
System Name *:	
System Sponsor:	
System Developer:	
Hardware Platform *	
Processor Type and Speed *	
Processor Accelerator(s) *	
Operating System and Version *	
Memory Option(s): * Memory Management Unit Floating Point Unit Cache Other (Specify)	
NITFS Software (name/version) *	
Native Mode Imagery Format	
Graphics Board(s)/Display Driver(s) *	
(# of bits supported by display)	
Image Processor Board *	
Frame Grabber Board *	
JPEG Compression Board *	
Other Auxiliary Processing Boards	

SYSTEM CONFIGURATION DATA	ITEM VALUE
Asynchronous Communications; Number and type of ports supported	
Synchronous Communications; Number and type of ports supported *	
Other Peripherals	
TEMPEST	
Waiver(s) Granted	
Miscellaneous	

* Indicates NITF Configuration Items.

Table II-1B. Software Configuration

ITEM	ITEM VALUES
NITF Software (name/version)	
Implementation Language(s)	
Assembler(s) Used For NITFS Modules	
Compiler(s) Used For NITFS Modules	
Linker(s) Used For NITFS Modules	
System Platform	
Graphical User Interface (GUI) Environment (X-Windows, Motif, etc. / version)	
Processor Type and Speed Required	
Operating System and Version Required	
Subscribes to POSIX Standards	
RAM required to operate system	
Storage required to operate system	
Graphics Board(s)/Display Driver Supported	

ITEM	ITEM VALUES
Image Processor Board(s) Supported	
Frame Grabber Board(s) Supported	
JPEG Compression Board(s) Supported	
Other Auxiliary Board(s) Supported/Required	
Networks/Protocols Supported: (TACO2, TCP/IP/FTP, LAN, WAN, etc)	
Asynchronous Communications Supported	
Synchronous Communications Supported	
NITFS Functions Not Supported	

* Indicates NITF Configuration Items.

Table II-2. Example of Data Collection Form

NITF Test Data	For : (System Name)	
SCENARIO	DESCRIPTION	COMMENTS

S1	Create PIAIMB Data file	File created properly
S2	Illegal PIAIMB Data file	System properly refused to create illegal file

Table II-3. Test Summary

TEST SUMMARY			
SUBTEST PIAIMB File Format	SUT Supported Y/N	STATUS	REMARKS
Generation			
Interpretation			
Usability	N/A		Service to sponsor, no pass/fail given

Table II-4 Composite Test Results Matrix

SUBTEST	SUT Supported Y/N	STATUS Pass/Fail	REMARKS
1. PIAIMB File Format			
2. PIAPRC File Format			
3. PIATGA File Format			
4. PIAPEA File Format			
5. PIAEVA File Format			
6. PIAEQA File Format			
7. Controlled Tags			
8. Usability	N/A	N/A	Provided as a service to the User

9 APPENDIX III, TEST SCENARIOS

9.1 General.

The SUT will create files using the following 24 scenarios. The following test files will be utilized. Image files that are used will be selected by the test director. In the area where padding spaces following alphanumeric entries or leading zeros before numeric entries is required, if the program automatically provides this, then the padding characters need not be entered. During the scenarios where the SUT should not allow the creation of a file, it will not be failed for accepting a short string, provided the data actually input to the file is of the legal length. To create an illegal condition, strings of greater than the allowed length should be used.

9.2 PIAIMB Scenarios.

9.2.1 Scenario (S1): PIAIMB Generate File.

The following information will be input and the SUT will properly format the file.

Field	Value
CETAG	PIAIMB
CEL	00377

Field	Value	Size	Value Range	Type
CLOUDCVR	050	3	000-100, 999	O
SRP	Y	1	Y, N	O
SENSMODE	“WHISKBROOM “	12	WHISKBROOM, PUSHBROOM, FRAMING, SPOT, SWATH, TBD	O
SENSNAME	Valid Sensor Name	18	Valid Sensor Name	O
SOURCE	“This is a simulated text entry of modest length - the remaining padding character spaces follow. The total is 255 characters. “	255	Alphanumeric	O
COMGEN	90	2	00-99	O

Field	Value	Size	Value Range	Type
SUBQUAL	G	1	P-Poor, G - Good, E - Excellent, F- Fair	O
PIAMSNNUM	EARS 1.1 page 4-28	7	EARS 1.1 page 4-28	O
CAMSPECS	Camera Specs (32A)	32	Alphanumeric	O
PROJID	EARS Appendix 9	2	EARS Appendix 9	O
GENERATION	4	1	0-9	O
ESD	Y	1	Y, N	O
OTHERCOND	EARS 1.1 page 4-28	2	EARS 1.1 page 4-28	O

9.2.2 Scenario (S2): PIAIMB Generate File.

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

Field	Initial Value	Final Value
CETAG	PIA MMM	PIAIMB
CEL	380	377
CLOUDCVR	120	050
SRP	F	Y
SENSMODE	“whisk”	“WHISKBROOM “
SENSNAME	Invalid name or illegal length (> 18 characters)	Valid Sensor Name
SOURCE	“This is an illegal length text entry (52 characters) This is an illegal length text entry (52 characters) This is an illegal length text entry (52 characters) This is an illegal length text entry (52 characters) This is an illegal length text entry (52 characters)” 260 characters total	“This is a legal length text entry ”
COMGEN	100	90
SUBQUAL	D	G
PIAMSNNUM	Invalid Number (>8 Characters)	EARS 1.1 page 4-28
CAMSPECS	This is an illegal length text entry (52 characters)	Camera Specs
PROJID	Illegal entry >2 Characters	EARS Appendix 9
GENERATION	12	4

Field	Initial Value	Final Value
ESD	y	Y
OTHERCOND	Illegal entry >2 Characters	EARS 1.1 page 4-28

9.2.3 Scenario (S3): PIAIMB Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAIMB file (scenario S1 may be used) attached to an image.

9.3 PIAPRC Scenarios

9.3.1 Scenario (S4): PIAPRC Generate File.

The following information will be input and the SUT will properly format the file. (Medium size)

Field	Value
CETAG	PIAPRC
CEL	01869 <Note: This number should be created by the SUT.>

Field	Value	Size	Value Range	Type
ACCESSID	"This is the access identifier. It is padded to be 64 characters"	64	Alphanumeric	R
FMCONTROL	"Foriegn data identifier, 32 char"	32	Alphanumeric	O
SUBDET	G	1	P- Poor, F - Fair, G - Good, E - Excellent	O
PRODCODE	EARS 1.1 Appendix 6	2		O
PRODUCERSE	"abc123"	6	Alphanumeric	O
PRODIDNO	"abcdefghij1234567890"	20	Alphanumeric	O
PRODSNME	"Product "	10	Alphanumeric	R
PRODUCERCD	PC	2	Alphanumeric	R
PRODCRTIME	151457360196	14	DDHHMMSSZMONYY	O
MAPID	"Southwest United States "	40	Alphanumeric	O
SECTITLEREP	10	2	0-99	R
SECTITLE1	"Section One "	40	Alphanumeric	C
PPNUM1	"Page 1"	5	Alphanumeric	C
TPP1	040	3	001-999	C
.....	<repeated 2 - 9>			
SECTITLEn10	"Section Ten "	40	Alphanumeric	C

Field	Value	Size	Value Range	Type
PPNUM10	“Page 1”	5	Alphanumeric	C
TPP10	040	3	001-999	C
REQORGREP	02	2	00-99	R
REQORG1	“This is the first Requesting Organization “	64	Alphanumeric	C
REQORGnn	“This is the second and last Requesting Organization “	64	Alphanumeric	C
KEYWORDREP	02	2	00-99	R
KEYWORD1	Keyword String 1 “	255	Alphanumeric	C
KEYWORD2	Keyword String 2, with padding to make it equal to 255 characters “	255	Alphanumeric	C
ASSRPTREP	02	2	00-99	R
ASSRPT1	“Associated Report 1 “	20	Alphanumeric	C
ASSRPT2	“Associated Report 2 “	20	Alphanumeric	C
ATEXTREP	00	2	00-99	R

Scenario (S5): PIAPRC Generate File.

The following information will be input and the SUT will properly format the file. This file will be large enough to require the use of the data extension segments.

Field	Value
CETAG	PIAPRC
CEL	63479 <Note: This number should be created by the SUT.>

Field	Value	Size	Value Range	Type
ACCESSID	"This is the access identifier. It is padded to be 64 characters"	64	Alphanumeric	R
FMCONTROL	"Foriegn data identifier, 32 char"	32	Alphanumeric	O
SUBDET	G	1	P- Poor, F - Fair, G - Good, E - Excellent	O
PRODCODE	EARS 1.1 Appendix 6	2		O
PRODUCERSE	"abc123"	6	Alphanumeric	O
PRODIDNO	"abcdefghij1234567890"	20	Alphanumeric	O
PRODSNME	"Product "	10	Alphanumeric	R
PRODUCERCD	PC	2	Alphanumeric	R
PRODCRTIME	151457360196	14	DDHHMMSSZMONYY	O
MAPID	"Southwest United States "	40	Alphanumeric	O
SECTITLEREP	99	2	0-99	R
SECTITLE1	"Section One "	40	Alphanumeric	C
PPNUM1	"Page 1"	5	Alphanumeric	C
TPP1	040	3	001-999	C
.....	<repeated 2 - 98			
SECTITLEn10	"Section Ninety Nine "	40	Alphanumeric	C
PPNUM10	"Page 1"	5	Alphanumeric	C
TPP10	040	3	001-999	C
REQORGREP	99	2	00-99	R

Field	Value	Size	Value Range	Type
REQORG1	"This is the first Requesting Organization "	64	Alphanumeric	C
	<repeat 2-98>			
REQORGnn	"This is the Ninety ninth requesting Organization "	64	Alphanumeric	C
KEYWORDREP	99	2	00-99	R
KEYWORD1	Keyword String 1 "	255	Alphanumeric	C
	<Repeat 2 - 98>			
KEYWORD2	Keyword String 99, with padding to make it equal to 255 characters "	255	Alphanumeric	C
ASSRPTREP	99	2	00-99	R
ASSRPT1	"Associated Report 1 "	20	Alphanumeric	C
	<repeated 2-98>			
ASSRPT2	"Associated Report 99 "	20	Alphanumeric	C
ATEXTREP	99	2	00-99	R

Field	Value	Size	Value Range	Type
ATEXT1	"Associated Text 1. This text field is also padded to be 255 characters "	255	Alphanumeric	C
	<repeated 2-98>			
ATEXT2	"Associated Text 99. This text field is padded to be 255 Characters "	255	Alphanumeric	C

9.3.2 Scenario (S6): PIAPRC Generate File.

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

Field	Value
CETAG	PIAPRC
CEL	01869 <Note: This number should be computed by the SUT>

Field	Initial Value	Final Value
ACCESSID	"This is the access identifier. It is less than 64 characters"	"This is the access identifier. It is padded to be 64 characters"

Field	Initial Value	Final Value
FMCONTROL	“Data identifier, 24 char”	“Foriegn data identifier, 32 char”
SUBDET	W	G
PRODCODE	“AAA”	EARS 1.1 Appendix 6
PRODUCERSE	“abc1”	“abc123”
PRODIDNO	“abcdefghij12345678”	“abcdefghij1234567890”
PRODSNME	“Product”	“Product “
PRODUCERCD	P	PC
PRODCRTIME	322561611300	151457360196
MAPID	“Southwest United States”	“Southwest United States “
SECTITLEREP	101	01
SECTITLE1	“Section One “	“Section One “
PPNUM1	“Page 10”	“Page 1”
TPP1	40	040
REQORGREP	1	01
REQORG1	“This is the first Requesting Organization”	“This is the first Requesting Organization “
KEYWORDREP	222	01
KEYWORD1	Keyword String 1”	Keyword String 1, with padding to make it equal to 255 characters “
ASSRPTREP	-2	02
ASSRPT1	“Report 1 “	“Associated Report 1 “
ASSRPT2	“Associated Report 2 “	“Associated Report 2 “
ATEXTREP	O2 <alpha character>	02

Field	Initial Value	Final Value
ATEXT1	“Associated Text 1. This text field is also padded to be 255 characters”	“Associated Text 1. This text field is also padded to be 255 characters “
ATEXT2	“Associated Text 2. This text field is padded to be 260 Characters “	“Associated Text 2. This text field is padded to be 255 Characters “

9.3.3 Scenario (S7): PIAPRC Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAPRC file (Scenario S4 may be used) attached to an image.

9.3.4 Scenario (S8): PIAPRC Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAPRC file which uses the DES (Scenario S5 may be used) attached to an image.

9.4 PIATGA Scenarios.

9.4.1 Scenario (S9): PIATGA Generate File.

The following information will be input and the SUT will properly format the file.

Field	Value
CELAG	PIATGA
CEL	00096

Field	Value	Size	Value Range	Type
TGTUTM	<legal value>	15	XXXNNnnnnnnnnn	O
PIATGAID	<legal value>	15	6 character Target ID 10 Character BE, or 15 character BE + suffix	O
PIACTRY	<legal value>	2	Per FIPS 10-3	O
PIACAT	<legal value>	5	DIAM 65-3-1	O
TGTGEO	334522X1024412Y	15	ddmmssXdddmmssY	O
DATUM	<legal value>	3	In accordance with Appendix B, Attachment 10, XI-DBDD-08 93 Aug 93.	O
TGTNAME	“The target is a Red Barn “	38	alphanumeric target names	O
PERCOVER	075	3	000-100	O

9.4.2 Scenario (S10): PIATGA Generate File.

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

Field	Initial Value	Final Value
CETAG	PIATTA	PIATGA
CEL	0090	00096
TGTUTM	<illegal value>	<legal value>

PIATGAID	<illegal value>	<legal value>
PIACTRY	<illegal value>	<legal value>
PIACAT	<illegal value>	<legal value>
TGTGEO	946262X1924412Y	334522X1024412Y
DATUM	<illegal value>	<legal value>
TGTNAME	“Target “	“The target is a Red Barn “
PERCOVER	175	075

9.4.3 Scenario (S11): PIATGA Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIATGA file (Scenario S9 may be used) attached to an image.

9.5 PIAPEA Scenarios

9.5.1 Scenario (S12): PIAPEA Generate File.

The following information will be input and the SUT will properly format the file.

Field	Name
CETAG	PIAPEA
CEL	00092

Field	Value	Size	Value Range	Type
LASTNME	“Smith “	28	Alphanumeric	O
FIRSTNME	“John “	28	Alphanumeric	O
MIDNME	“Irving “	28	Alphanumeric	O
DOB	031550	6	MMDDYY	O
ASSOCTRY	Per FIPS 10-3	2	Per FIPS 10-3	O

9.5.2 Scenario (S13): PIAPEA Generate File.

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

Field	Initial Value	Final Value
CETAG	PIAEEA	PIAPEA
CEL	00100	00092
LASTNME	“Smith “	“Smith “
FIRSTNME	“John “	“John “
MIDNME	“Irving “	“Irving “
DOB	134550	031550
ASSOCTRY	Not Per FIPS 10-3	Per FIPS 10-3

9.5.3 Scenario (S14): PIAPEA Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAPEA file (Scenario S12 may be used) attached to an image.

9.6 PIAEVA Scenarios

9.6.1 Scenario (S15): PIAEVA Generate File.

The following information will be input and the SUT will properly format the file.

Field	Value
CETAG	PIAEVA
CEL	00046

Field	Value	Size	Value Range	Type
EVENTNAME	"Members of OPEC "	38	Alphanumeric	O
EVENTTYPE	"CIVIL "	8	POL, DIS, COMMO, MILEX, ECON, NUC, SPACE, MILMOV, CIVIL	O

9.6.2 Scenario (S16): PIAEVA Generate File

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

Field	Initial Value	Final Value
CETAG	PIAETA	PIAEVA
CEL	00050	00046
EVENTNAME	This is an Event Name that is too long to be legal	"Members of OPEC "
EVENTTYPE	"ROCK "	"CIVIL "

9.6.3 Scenario (S17): PIAEVA Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAEVA file (Scenario S15 may be used) attached to an image.

9.7 PIAEQA Scenarios

9.7.1 Scenario (S18): PIAEQA Generate File.

The following information will be input and the SUT will properly format the file.

Field	Value
CETAG	PIAEQA
CEL	00130

Field	Value	Size	Value Range	Type
EQPCODE	Equipment Code	7	DDB-2600-4040-YR	O
EQPNOMEN	Equipment Nomenclature	45	DDB-266600-4040-YR	O
EQPMAN	Equipment Manufacturer	64	Alphanumeric	O
OBTYPE	OB Type	1	MIIDS/IDB	O
ORDBAT	Type Order of Battle	3	NERCM and DIAM 57-5-4	O
CTRYPROD	Country Produced	2	FIPS 10-3	O
CTRYDSN	Country Code Designed	2	FIPS 10-3	O
OBJVIEW	Object View	6	Right, Left, Top, Bottom, Front, Rear	O

9.7.2 Scenario (S19): PIAEQA Generate File.

The Operator will attempt to enter the following file. The SUT will not allow the errors to be processed. The second (Final value) may be input to allow the system to continue to process the input.

9.7.3 Scenario (S20): PIAEQA Interpret File.

The following information will be provided to the SUT, which will properly read the file.

A legal PIAEQA file (Scenario S18 may be used) attached to an image.

9.8 Controlled Extension Scenarios

9.8.1 Scenario (S21): Controlled Tag Extensions Generate File.

A large legal file (Scenario S8 may be used) will be combined with an approved Controlled Tag Extension file and the SUT will properly format the file.

9.8.2 Scenario (S22): Controlled Tag Extensions Generate File.

A legal file (Scenario S1 may be used) will be combined with an approved Controlled Tag Extension file that is large enough to require the use of the Data Extension Segments. The SUT will properly format the file.

9.8.3 Scenario (S23): Controlled Tag Extensions Interpret File.

A legal file (Scenario S22 may be used) that is large enough to require the use of the Data Extension Segments. The SUT will properly interpret the file.

10 APPENDIX IV, TEST CASES

10.1 General.

This appendix provides the test procedures used to verify to what extent a SUT has correctly implemented the NITFS. The respective standard for each subtest provides the low level criteria. Tables IV-1B and IV-1B provide a checklist for each of the elements that the file formats must pass.
The requirements of the individual NITF standards cannot be economically tested independently; therefore, the test cases have been developed to accumulate specific objectives and measure test criteria for several subtests at the same time. Subtests 1-6 in this test plan correlate the test objectives to the criteria in the suite of NITF standards. Subtest 7 is the Controlled tags extension test (Test 17) and Subtest 8 (Useability) is Test 20 in the standard NITFS Certification test plan.

10.2 NIFTS Format Test Approach.

The test approach used to validate the controlled extensions is to first test the extensions by themselves to determine if proper formating is being accomplished, then by determining that the SUT will not allow the creation of an improperly formatted extension. Once this is accomplished, the extension will be merged with an imagery product, and finally the NITF standard test 17, Controlled Extension test is run. The human factors evaluation is accomplished in parallel with these activities. To accomplish the test objectives, subtests, test cases and test scenarios were established as described below.

10.3 Subtests.

Subtests were developed to test the SUT against the required format of the controlled extensions, and to determine if the SUT would allow the creation of an improperly formatted extension.

10.4 Test Scenarios.

Test Scenarios consist of the specific NITF files and procedures used to execute the test. The NITFS capabilities of the SUT are identified and the appropriate test cases are selected and grouped into NITF test scenarios. Test scenarios measure to what extent the SUT correctly generates properly formatted files and its ability to interpret NITF files. When all test scenarios have been processed by the SUT for a given test, all of the applicable subtest criteria will have been tested.

10.5 Useability Test Approach.

Though a system can be in technical compliance with the standards, it may not be well suited for use in its targeted user environment. The useability subtest was developed using HFE principles and serves as a means to raise the sponsor's awareness of human factors considerations. The useability subtest is a checklist based upon observations made during past NITF certification tests. The criteria listed in the checklist (Appendix IV-3, Subtest 8 Usability) will be evaluated by the NITFS CTE Facility and will be discussed in the test report, but they will not be considered compliance criteria for certification. Sponsors are

encouraged to provide the NITFS CTE Facility additional useability test criteria that they would like to have evaluated during certification testing of their system.

Table IV-1A, SUBTEST 1-6 File Formats (Generate)

TEST CASE	S1	S2	S4	S5	S6	S9	S10	S12	S13	S15	S16	S18	S19
a. All information, including numbers, contained in the fields must be given in the printable ASCII character set [space (32) through tilde (126)] with eight bits (one byte) per character.													
b. All length sizes or character counts given in header and subheader fields must specify the number of eight-bit bytes.													
c. All data in fields designated as "Alphanumeric" must be left justified and padded with spaces as necessary to fill the field.													
d. All data in numeric fields must be right justified and padded with leading zeroes as necessary to fill the field.													
e. All required fields must be present and must contain valid data.													
f. All optional fields must be present, but may or may not contain valid data at the discretion of the operator. In the absence of valid data, optional numeric fields must be filled with zeroes; optional alphanumeric fields must be filled with spaces.													

g. Conditional fields are present only if indicated by the value of one or more preceding fields. If a conditional field is present, it must contain valid data.	X	X				X	X	X	X	X	X	X	X
h. File sizes for CLEVEL 1 files must not exceed 1,213,000 bytes and CLEVEL 6 files cannot exceed 2 Gbytes.	X	X				X	X	X	X	X	X	X	X

X= Do not test

Table IV-1B, SUBTEST 1-6 File Formats (Interpret)

TEST CASE	S3	S7	S8	S11	S14	S17	S20				
a. All information, including numbers, contained in the fields must be given in the printable ASCII character set [space (32) through tilde (126)] with eight bits (one byte) per character.											
b. All length sizes or character counts given in header and subheader fields must specify the number of eight-bit bytes.											
c. All data in fields designated as "Alphanumeric" must be left justified and padded with spaces as necessary to fill the field.											
d. All data in numeric fields must be right justified and padded with leading zeroes as necessary to fill the field.											
e. All required fields must be present and must contain valid data.											
f. All optional fields must be present, but may or may not contain valid data at the discretion of the operator. In the absence of valid data, optional numeric fields must be filled with zeroes; optional alphanumeric fields must be filled with spaces.											
g. Conditional fields are present only if indicated by the value of one or more preceding fields. If a conditional field is present, it must contain valid data.	X	X		X	X	X	X	X	X	X	X

X = Don’t Test

Table IV-2A, SUBTEST 7 (Generate)

TEST CASE	S21	S22
1. Systems using extended data will only use the Image Extended Data Field of the base image.		
2. Controlled Tags will consist of three required fields, CETAG, CEL, and CEDATA.		
3. If extended data appears in any field other that the IXSHD, the system must warn the operator that the file is not compliant		

Table IV-2B, SUBTEST 7 (Intrepret)

TEST CASE	S23
1. Upon receipt of a file which contains information in the exteded data fields, the system must at least properly interpret the other legal components of the NITF file.	
2. If the extended data fields contain a control tag in the Image Extended Data field, the system must properly interpret the data.	
3. Tags will consist of three required fields, CETAG, CEL, and CEDATA.	
4. Tags are currently limited to appear only in the extended image data field of the base image.	

X = Don't test

Table IV-3, SUBTEST 8. Usability

CRITERIA	YES	NO	UNK	COMMENTS
A. SYSTEM DOCUMENTATION. *Review documents and verify the following specific items.*				
A1a. A description of the potential user was provided.				
A1a(1) Education level.				
A1a(2) Necessary skills.				
A1a(3) Skill levels.				
A1b. The SUT operator fits the user description for:				
A1b(1) Education level.				
A1b(2) Necessary skills.				
A1b(3) Skill levels.				
A2. An HFE Evaluation Report was provided.				
A3. An operator's manual for the system was provided.				
A3a. The manual is up-to-date.				
A3b. The manual is easy to use.				
A3b(1) It is systematically formatted.				
A3b(2) It makes minimal use of cross-reference.				
A3b(3) It is one volume.				
A3b(4) The manual is a reasonable size.				
A3b(5) Information in manual is easily located.				

A3b(6) Actual system performance agrees with system performance description in documentation.				
A3b(7) System input requirements agree with user's manual.				
A3c. The manual is easy to understand.				
A3c(1) It contains a useful table of contents.				
A3c(2) It contains a useful index.				
A3c(3) It contains a useful glossary.				
A3c(4) Alternatives to normal operating procedures are described separately, not embedded in normal procedures.				
A3c(5) The manual clearly explains the normal operational steps to accomplish:				
Log-On.				
Activity Selection.				
File Preparation.				
Preparing Symbols.				
Preparing Labels.				
Preparing Text Files.				
Compressing Imagery.				
Packing Imagery.				
Packing bit-mapped symbols.				

Packing Labels.				
Packing Text Files.				
Transmitting Files.				
Receiving Files.				
Decompressing compressed Imagery.				
Unpacking Imagery.				
Unpacking Symbols.				
Unpacking Labels.				
Unpacking Text Files.				
Configuring TACO2 parameters.				
Exchanging Files w/ TACO2.				
B. THE SYSTEM. *Observe system operation in conjunction with NITF certification testing. Answer data items in the order they occur (which will probably not be in the order listed).*				
B1. The system has the appearance of a single integrated application. There is no perception of needing to exit and enter multiple routines to handle NITF operations.				
B2. The system displays NITF file components (images, symbols, labels) automatically according to the NITF file header values without operator intervention.				
B3. The system allows the operator to view text components or image comment fields in conjunction with the image.				
B4. Roaming or panning capability is provided.				

C. USER-FRIENDLINESS.				
C1. Descriptiveness.				
C1a. Legitimate responses are explained.				
C1b. On-line HELP is provided.				
C1c. On-line HELP is concise and easy to understand.				
C1d. The user can access on-line explanations for each command.				
C1e. Information required by the user to perform required duties is available.				
C1f. Information required by the user to perform required duties can be easily accessed.				
C2. Consistency.				
C2a. Symbols are consistent.				
C2b. Terminology is consistent.				
C2c. Commands are entered in a standard manner.				
C2d. System messages are systematically formatted.				
C2e. A user entry always results in a system response.				
C2f. Response times for similar activities are similar.				

C3. Simplicity.				
C3a. The user is not required to enter commands at the operating system prompt once the application is started.				
C3b. Actions required of the user are easy to understand.				
C3c. Instructions and menu selections are clear.				
C3d. Required user entries are short.				
C3e. Displayed messages are short.				
C3f. Each new message contains only one idea to which the user must respond.				
C3g. All essential information is displayed.				
C3h. Only essential information is displayed.				
C3i. The display is not crowded.				
C3j. Difficult words or characters are rarely used.				
C3k. Formats in which data are presented are easily understandable.				
C3l. Control actions are simple and direct.				
C3m. Destructive actions are difficult.				
C3n. User verification is required to permanently modify data.				
C3o. Critical entries must be acknowledged by the user prior to system implementation.				
C3p. At log-off, the system checks and prompts for confirmation of pending actions.				

C4. Confirmability.				
C4a. Input errors do not cause system failures.				
C4b. User input errors are detected.				
C4c. The cause of user input rejection is displayed.				
C4e. Displayed messages are:				
C4e(1) Constructive and neutral in tone.				
C4e(2) Presented from the user's point of view.				
C4e(3) Appropriate to the user's level of training.				
C4e(4) As specific as possible.				
C4e(5) Presented with as much diagnostic information and remedial direction as can be inferred from the error condition.				
C4f. The system displays the action required to correct an input error.				
C4g. User input errors are easily corrected.				
C4h. Input can be verified before execution/entry.				
C4i. The data entry display has a cursor or pointer.				
C4j. A backspace or delete key is provided to correct mistyped characters.				
C4k. The user can easily correct mistyped characters with the backspace or delete key.				
C4l. The user does not have to copy information manually in order to use the system.				

C4m. Task aborts or interrupts do not cause detrimental side effects.				
C4n. The system automatically stops or takes some other appropriate action when an internal error is detected.				
C4o. The cause of a system halt is displayed.				
C5. Controllability.				
C5a. The user can interrupt and resume automatic processes.				
C5b. Task-abort capability is provided.				
C5c. The user can control the amount of explanatory text displayed.				
C5d. Different modes of operation can be commanded, depending on the user's skill level.				
C5e. The current status of system operation is provided automatically or can be easily accessed.				
C5f. The user can select the type and quantity of data displayed.				
C5g. The user can control the type and quantity of output.				
C5h. Output data can be sent to various devices.				
C6. Workload Suitability.				
C6a. The user can easily enter mission peculiar data.				
C6b. Data preparation can be accomplished on-line.				
C6c. Menu techniques are used to aid in making decisions.				
C6d. An initial menu of control options is available for user selection.				
C6e. Menus are readily available at all times.				

C6f. Menu selections are listed in a logical order or alphabetically, if no logical order, such as frequency of use, exists.				
C6g. When the number of options can fit on one page in no more than two columns, a simple menu is used.				
C6h. When the user must key through multiple menus to make a selection, the structure is designed to minimize the number of levels required.				
C6i. When multiple levels are provided, an indication of current position in the menu structure is displayed.				
C6j. When the user must select from a discrete set of options, the options are displayed at the time of selection.				
C6k. The system can be operated without reference to manuals during normal operations.				
C6l. The user must know only a small number of commands to operate the system.				
C6m. Messages from the system are easy to understand.				
C6n. Messages from the system are provided at a comfortable rate.				
C6o. The amount of data presented at one time is appropriate to the task being accomplished.				
C6p. System software can be reloaded quickly.				
C6q. System software reloads are required infrequently.				
C6r. The tasks required of the user are within the user's capability.				
C6s. The user performs a useful meaningful role.				
C6t. The user makes command decisions involving unusual situations.				

C6u. The computer performs repetitive tasks.				
C6v. The user is not continuously forced to wait for the system to respond.				
D. USER ALERTS.				
D1. User alerts are provided for aspects not readily apparent in the system or file being viewed.				
D2. The user is automatically alerted that text or image comment fields are included with the NITF file being viewed.				
D3. A rendering device (screen or other) cannot process an image, because it does not have the same pixel display capacity as the imagey processing board.				
D4. The user is automatically alerted when the rendered image is cropped.				
D5. The user is alerted when the system requires action.				
E. CHANGES AND ADDITIONS. The following can be easily accomplished, depending on user access privileges, without recoding and recompiling the program:				
E1. Setting the image display parameters.				
E2. Changing the image display parameters.				
E3. Setting the system's default values.				
E4. Changing the system's defaults.				
E5. Adding labels.				
E6. Editing labels.				
E7. Adding text.				

E8. Editing text.				
E9. Adding symbols.				
E10. Editing symbols.				
F. THE NITF FILE PREPARATION PROCESS.				
F1. The system provides adequate information and guidance during the file preparation process for users with no knowledge of boundary requirements to prepare NITF files that do not exceed established boundary conditions for each compliance level.				
F2. The system permits only the NITFS ASCII set of characters (without special word processing control codes, but with the proper CR/LF line terminators) to be entered in labels or text files.				
F3. The system allows users to perform the following operations on graphic elements:				
F3a. Designate.				
F3b. Select.				
F3c. Manipulate.				
F3d. Move.				
F3e. Store.				
F3f. Retrieve.				
F3g. Display.				